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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,272	11/25/2003	HeeDong Lee	UNI 0050 PA/40809.67	1249

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EXAMINER
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KOSLOW, CAROL M

ART UNIT	PAPER NUMBER
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1755

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/724,272

Applicant(s)

LEE ET AL.

Examiner

C. Melissa Koslow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22, 29, 30, 33, 36 and 37 is/are allowed.
- 6) ☒ Claim(s) 1-21, 23-27, 31, 32, 34, 35, 38-40, 43 and 46-48 is/are rejected.
- 7) ☒ Claim(s) 28, 41, 42, 44 and 45 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/27/04</u> . | 6) <input type="checkbox"/> Other: ____.  |

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The Japanese references cited in the Information Disclosure Statement of 27 February 2004 were considered with respect the provided English abstracts.

The disclosure is objected to because of the following informalities: Paragraph [0006] teaches the compact comprises a powder mixture having yttrium aluminum perovskite, but the other powder in the mixture is not defined. Appropriate correction is required.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: There is no teaching in the specification of combinations of rare earth dopants, as in claims 11 and 28. There is no teaching the reducing agent is a combination of beta- and DL-alanine as in claims 13 and 29.

Claim 12 is objected to because of the following informalities: In this claim “agent comprising” appears twice in a row. One of the two “agent comprising” should be deleted. Appropriate correction is required.

Claims 21 and 39 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to rewrite the claims in independent form.

These claims are directed to a method for forming a YAG ceramic form the powder produced by the processes of claims 1 and 22. Thus these claims do not further limit the process of claims 1 and 22.

Claims 2-7, 9, 12-14, 24-26 and 38 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to

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reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 38 teaches the powder comprising yttrium aluminum perovskite has a primary particle size between about 30-50 nm. Paragraph [0019] teaches the powder comprising yttrium aluminum perovskite has a primary particle size between about 30-60 nm. Applicants need to correct this discrepancy in the size ranges. Claims 2-7, 9, 12-14 and 24-26 teach the aluminum salt comprises aluminum nitrate, perchlorate or sulfate; the yttrium salt comprises yttrium nitrate, perchlorate or sulfate, that the auxiliary oxidizing agent comprises ammonium nitrate and the reducing agent comprises at least one alanine. The specification teaches the aluminum salt is selected from aluminum nitrate, perchlorate or sulfate; the yttrium salt is selected yttrium nitrate, perchlorate or sulfate, that the auxiliary oxidizing agent is ammonium nitrate and the reducing agent is at least one alanine. Applicants need to correct the discrepancy in the composition of the salts, the reducing agent and the oxidizing agent. Applicants are reminded that “comprises” opens the composition to the presence of any other component.

Claims 16, 17, 21, 23, 27, 31, 32, 34, 35 and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 is indefinite since it contains the improper Markush terminology “is selected from comprises”. Claim 27 recites the limitation “said salt of aluminum”. There is insufficient antecedent basis for this limitation in the claim or in claim 22. Claims 16 and 31 recite the limitation “the water”. There is insufficient antecedent basis for this limitation in the claim or in claims 1 and 22. Claims 17, 32, 34 and 35 are indefinite. The use of the term “comprising” to

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define a temperature range is an improper use of this term. In these claims, "comprises" should be replaced by "is". Claims 21 and 39 are improperly dependent on claims 1 and 22 respectively. Claims 1 and 22 are directed to a method for producing a powder, while claims 21 and 39 are directed to a method of forming a YAG ceramic. Claims 21 and 39 should be rewritten as independent claims.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,844,285.

This patent teaches a polycrystalline transparent ceramic comprising YAG used in HID lamps. Thus the ceramic is transparent to visible light. Column 4, lines 30-39 teaches a polycrystalline transparent ceramic comprising YAG which has a grain size of about 2-5 micron, which indicates, if the taught range is not the mean size range, that the mean grain size in the range of 2-5 microns, which overlaps the claimed size range. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The reference suggests the claimed ceramic.

Claims 40, 43 and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 5,484,750.

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This reference teaches transparent polycrystalline garnet ceramics and the method for producing these ceramics. Column 9, line 45 teaches the taught ceramic is transparent to visible light. Column 10, lines 25-61 teach the garnet can be doped YAG and that the general process is to provide a compact of the doped YAG powder, to sinter the compact, to hot isostatic press the sintered compact and then surface the polish the ceramic. Column 15, lines 35-60 teach the specific processing conditions. The reference teaches the sintering temperature is in the range of 1400-1600°C in flowing oxygen until the ceramic has a density in the range of about 95-98% of theoretical density. The temperature range overlaps that claimed and the density range falls within the claimed range. The sintered compact is hot isostatically pressed at a temperature in the range of 1350-1600°C at a pressure in the range of 5-25 ksi, where the pressing atmosphere is argon. The taught hot isostatic pressing temperature encompasses the claimed range and the pressure overlaps the claimed range. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). Since the process conditions overlap, one of ordinary skill in the art would expect the resulting ceramic to have a mean grain size that overlaps the claimed range, absent any showing to the contrary. Similar processes can reasonably be expected to yield products which inherently have the same properties. *In re Spada* 15 USPQ2d 1655 (CAFC 1990); *In re DeBlauwe* 222 USPQ 191; *In re Wiegand* 86 USPQ 155 (CCPA 1950). The reference does not teach what is used to polish by light mechanical grinding, which suggests that any well known method can be utilized, such as with a diamond slurry. While the reference does not teach the use of high pure argon, one of ordinary skill in the art

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would know to use high purity argon to minimize the amount of impurities which may detrimentally impair the transparency, the radiation damage, afterglow and luminescent efficiency, as indicated in column 13, lines 40-43. The reference suggests the claimed process and ceramic.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 5,114,702 in view of U.S. patent 5,484,750.

U.S. patent 5,114,702 teaches the process for forming any ceramic powder by forming an aqueous mixture from stoichiometric amounts of salts of the desired metals which appear in the ceramic, adding a combustible amino acid and ammonium nitrate to the mixture, heating the mixture at a temperature such that the mixture undergoes combustion and a powder is formed and then calcining the powder to form the ceramic. The metal salts can be perchlorates, sulfated and preferably nitrates, such as those in claim 9 (col. 3, lines 1-44). The amino acid can be alanine, which suggests that any form or combination of forms of alanine can be used. The molar amount of amino acid and ammonium nitrate is about 0.5-6 times the amount of metal cations (col. 3, lines 59-68), which overlaps the claimed range. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The mixture is concentrated by evaporating water by heating before the combustion step. The powders resulting from this process have a primary size in the range of 20-300 nm, which encompasses the claimed range. While U.S. patent 5,114,702 only gives the combustion temperature for glycerin, it teaches that the temperature range is that which fully consumes the

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amino acids but does not cause the resulting particles to fuse and/or sinter. This range would be expected to overlap the claimed range, which appears to achieve this purpose. While U.S. patent 5,114,702 does not teach de-agglomerating the powder before calcining, one of ordinary skill in the art would have found it obvious to do this to ensure there is no sintering between the powder particles. U.S. patent 5,484,750 teaches forming doped YAG ceramics from YAG powders, which can contain cerium or neodymium dopants. Thus it shows that YAG powder is known and desirable in the art. Accordingly, one of ordinary skill in the art would have found it obvious to form YAG powders by the method of U.S. patent 5,114,702, which means the metals are Al and Y and optionally Ce or Nd and the molar ratio of Al to Y or, Y and Ce or Nd, is 5:3.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 5,484,750 in view of U.S. patent 4,114,702.

As discussed above, U.S. patent 5,484,750 suggests the method set forth in this claim but it does not the claimed method for producing the powder used in the method. U.S. patent 5,484,750 indicated that known precipitation method can be used to form the powder used in the taught process (col. 20, lines 50-67). As discussed above, U.S. patent 4,114,702 suggests the claimed process for producing a doped YAG powder. Therefore one of ordinary skill in the art would have found it obvious to use a doped YAG powder produced by the process suggested by U.S. patent 4,114,702 and then to form a transparent polycrystalline YAG ceramic from this powder using the process suggested by U.S. patent 5,484,750. The references suggest the claimed process.

Claims 22, 29, 30, 33, 36 and 37 are allowable over the cited art of record.



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Claims 28, 41, 42, 44 and 45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 23-27, 31, 32, 34, 35, 38 and 39 would be allowable if rewritten or amended to overcome the objections and rejections under 35 U.S.C. 112 set forth in this Office action.

The processes of claims 22-39 are not taught or suggested by the cited art of record.

There is no suggestion or teaching in U.S. patent 5,484,750 to adjust the taught sintering time and hot isostatically pressing time and pressure range so they overlap the claimed times and pressure. There is no teaching or suggestion in U.S. patent 5,484,750 of the claimed heating and cooling rate for the taught sintering step.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Bell, can be reached at (571) 272-1362.

The fax number for all official communications is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cmk  
February 4, 2005

  
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Primary Examiner  
Tech. Center 1700